

Editor's column

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I would like to thank the staff of The Next Wave (TNW) for the opportunity to write this issue's guest editor's column. It is an honor to contribute to TNW, especially because this is an issue that looks ahead to a future world in which scientific insights are applied to new or improved technologies that touch our lives. It is in this context that I would like to discuss foresight and the art and science of technology forecasting and why these four feature articles are valuable at so many levels.

After deep consideration of a Canadian colleague's clear argument over these past years, I now share his view that foresight is a strategic tool that does use technology forecasting inputs. Furthermore, we agree that foresight is even more than that. Our shared mental model defines foresight as about thinking, debating, and bounding the diverse technology futures that lie ahead. Thus, foresight is the application of critical thinking to longterm developments, trends, and emerging or disruptive technology breakthroughs. Foresight is about anticipating, with adequate lead time, the possibilities. Ultimately, foresight, we believe, informs decisive action.

Foresight activities include

- Examining long-range prospective developments;
- Identifying and understanding key factors and drivers of change;
- Accounting for risk, diversity, and contingencies;
- Anticipating multiple, plausible futures; and
- ▶ Highlighting emerging opportunities and threats.

Foresight's contributions to decisive action result in gaming or rehearsal of potential critical challenges and identification of transition strategies that move toward preferred futures.

Drs. Cox and Mosser describe the concept of US Department of Defense (DoD) forecasting which "implies foresight, planning, and careful consideration of how the future operating environment may look" [1]. And they emphasize DoD forecasting implies a "conscious effort to match capabilities to resources" [1]. The authors also note that these activities occur at every level of the defense and security apparatus, and that national policy and strategy are intertwined at the very highest levels.

This approach is reflected in DoD Directive 7024.20 of September 25, 2008, issued by the Deputy Secretary of Defense. Capability portfolio management is described as "optimiz[ing] capability investments across the defense enterprise [so as to] minimize risk in meeting the Department's capability needs in support of strategy" and that this would be done by leveraging the expertise available in various forums and identifying issues, priorities, and capability or resource mismatches for decision makers [2].

The fundamental elements of forecasting and foresight are a) scanning the horizon, b) identifying potentially critical technology, c) predicting the likelihood of emergence, d) anticipating the potentials or effects to business and processes, e) and then optimizing the future capability portfolio in time to remain mission effective. The most

difficult problem, of course, is identifying and acting on discontinuous or massively disruptive technologies.

Experiments are under way today that may flatten forecasting and foresight activities in organizations. For example, the Intelligence Advanced Research Projects Activity's Aggregative Contingent Estimation program seeks to "dramatically enhance the accuracy, precision, and timeliness of intelligence forecasts for a broad range of event types" [3]. If successful, the promise seems to be accurate insights and a significant reduction in costs typically associated with full-bore, formal forecasting and foresight activities. One interesting activity within that undertaking is the Good Judgment Project (see http://www.goodjudgmentproject.com).

Similar activities are under way elsewhere. Dreyer and Stang's review of worldwide governmental foresight activities is useful for at least three reasons. First, the reader is presented with a historical review of the foresight movement. Second, key methods are discussed and compared. Third, a number of foresight projects in Australia, New Zealand, the Nordic countries, the European Union, and elsewhere are identified. Implementations in 22 countries are noted [4].

With that said, it is time to turn our attention to the articles and insights of our experts. What are the implications embedded in each of these forecasts? What foresight do we derive from their words?

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